Control-/Data Plane for N6 Traffic Steering

https://www.ietf.org/id/draft-fattore-dmm-n6-trafficsteering-01.txt

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Background & Motivation

- Various drafts published in the context of data plane protocol solutions for the 3GPP mobile architecture’s N9 interface
- Routing of IP PDUs assumed on N6 interface
- Future support of industry verticals:
  - Demand for more flexible deployment options (→ customization) and traffic steering
  - Mobile device applications connect to multiple distributed data networks (central, edge)

- This draft:
  - Enable de-coupling of anchoring UPF(s) from data network(s) and UPF distribution
  - Enable enforcement of traffic treatment policies on N6 interface for complete end-to-end policy control
Use Cases and Problem Statement (1/2)

- Mobile applications associated with services in multiple data networks
- Mobile control plane selects and configures main anchor UPF and complementary anchor UPF(s) to access multiple distributed data networks
  - UL/DL traffic treatment on UPFs configured by control plane
  - DL traffic from data network(s) to UPF(s) may be ambiguous (not aligned with mobile core)
- Control routing of DL traffic from data networks to the most suitable anchor UPF
- Need to enforce traffic treatment rules on data network side

![Diagram showing mobile control plane and UPFs](image)

**Abbreviations:**
- DN: Data Network
- AS: Application Server
- DPN: Data Plane Node
- UPF_a: Anchor User Plane Function
- UPF_i: intermediate UPF

**Legend:**
- N3
- N9
- N6
- local DN
- DN
- AS
- DPN

Legend:
- DN: Data Network
- AS: Application Server
- DPN: Data Plane Node
- UPF_a: Anchor User Plane Function
- UPF_i: intermediate UPF
Use Cases and Problem Statement (2/2)

- Edge deployment of anchor UPF, e.g. to enable low-latency service access
- Re-configuration of the data plane to maintain required service level
- Re-selection and configuration of new anchor UPF (also refer to MFA draft https://www.ietf.org/id/draft-gundavelli-dmm-mfa-01.txt)
- Update data plane on N6 to steer traffic to new UPF
  - Use of SRv6, tunnel, ID-LOC, ..
Scope of this draft

- Use cases and **operation** of de-centralized mobile data plane
  - Flexible deployment and re-configuration of anchor UPF(s)

- **Semantics** and **data models** for DPN traffic treatment policies (UL, DL) on N6
  - Enforcement at data network(s) (DPN/AS) for DL traffic and at anchor UPF for UL traffic
  - Use of SRv6, ID-LOC, LOC re-write, .. policies for traffic steering

- **Architecture** to bind end-to-end data plane control to Mobile Control Plane and required semantics to/from 3GPP control plane
Status

- Draft focus has been discussed before IETF103. Interest and valuable feedback received.
- First version published e.o. Sept 2018. Discussed at IETF103 – valuable feedback
- More discussion and feedback after IETF103, in particular about applicability to distributed edge clouds and MEC
- Draft updated before IETF104
  - Deployment and operational aspects
  - Supports data plane *loose coupling* and *tight coupling* options
    - N6 rules on UPF-side received either through 5G Control Plane or from TN Controller
  - More energy needed to elaborate on a mature info model
N6 PEPs – Loose coupling vs tight coupling
MEC – 5GC deployment – site local operation
MEC – 5GC deployment – inter-site operation (1/3)
MEC – 5GC deployment – inter-site operation (2/3)

- Relevant policy enforcement points
- *) Traffic steering, e.g. by segment routes, locator re-write, tunnel
MEC – 5GC deployment – inter-site operation (3/3)
Next

- Revise document structure to focus on the identified scope and objectives
- Converge on a suitable notation
  - Operational aspects
  - Semantics / models
- Target clean update by June 2019
- WG interested in adopting this work?
- Liaise this work with 3GPP / ETSI MEC